



University
of Regina

$H(e, e')p$ Study

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Event Selection

$(H_gtr_dp > -8) \& (H_gtr_dp < 8)$

$(P_gtr_dp > -10) \& (P_gtr_dp < 20)$

$(H_gtr_xp > -0.08) \& (H_gtr_xp < 0.08)$

$(H_gtr_yp > -0.045) \& (H_gtr_yp < 0.045)$

$(P_gtr_xp > -0.06) \& (P_gtr_xp < 0.06)$

$(P_gtr_yp > -0.04) \& (P_gtr_yp < 0.04)$

$(CTime_epCoinTime_ROC1 > ((0) - ((4.008)/2.0) - (0.25))) \&$
 $(CTime_epCoinTime_ROC1 < ((0) + ((4.008)/2.0) + (0.25)))$

$(abs(H_gtr_beta - 1)) < 0.3)$

$(H_cer_npeSum > 1.5)$

$(H_cal_etottracknorm > 0.7)$

Data and MC Yields Calculation

total_data_effective_charge = BCM1_Charge x HMS_Elec_SING_TRACK_EFF x
SHMS_Prot_SING_TRACK_EFF x HMS_cer_eff x HMS_cal_eff x
SHMS_Hodo_3_of_4_EFF x HMS_Hodo_3_of_4_EFF x Non_Scaler_EDTM_Live_Time x
data_Boiling_factor

```
data_Boiling_factor = 1 + (-0.0007899 * data_BCM1_Beam_Cut_Current)
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```
normfac_data = 1.0/(total_data_effective_charge)
```

```
dummy_target_corr = 4.8579
```

```
normfac_dummy = 1.0/(total_dummy_effective_charge*dummy_target_corr)
```

```
normfac_simc = (simc_normfactor)/(simc_nevents)
```

Data and MC Yields Calculation

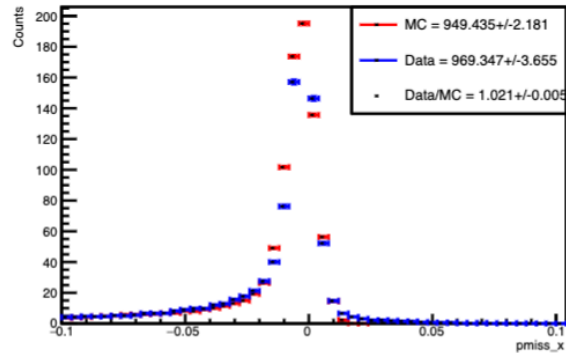
	3.8 GeV	3.8 GeV	3.8 GeV	4.9 GeV	4.9 GeV	4.9 GeV
Run	6634	6635	6637	6881	6882	6883
BCM1_Charge	44.478	35.168	28.340	68.724	72.204	38.745
HMS_Elec_SING_TRACK_EFF	0.998	0.998	0.998	0.998	0.998	0.998
SHMS_Prot_SING_TRACK_EFF	0.997	0.997	0.997	0.997	0.997	0.997
HMS_cer_eff	0.971	0.971	0.971	0.971	0.971	0.971
HMS_cal_eff	0.992	0.992	0.992	0.992	0.992	0.992
SHMS_Hodo_3_of_4_EFF	0.992	0.992	0.993	0.991	0.991	0.993
HMS_Hodo_3_of_4_EFF	1.000	1.000	1.000	1.000	1.000	1.000
Non_Scaler_EDTM_Live_Time	1.000	1.001	1.000	0.857	0.856	1.001
data_Boiling_factor	0.960	0.960	N/A	0.945	0.944	N/A

Data vs. MC

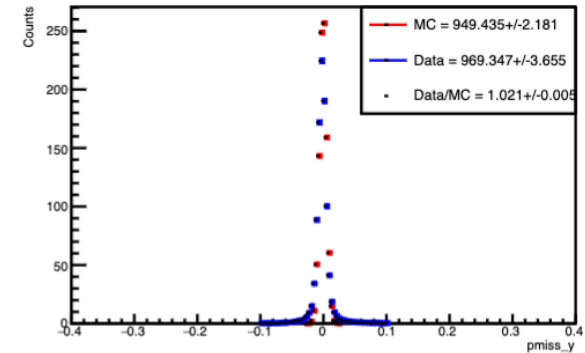
3.8 GeV

HeePCoin Setting
Beam Energy = 3.834
HMS_p = 2.026
HMS_theta = 38.6
SHMS_p = 2.583
SHMS_theta = 29.305

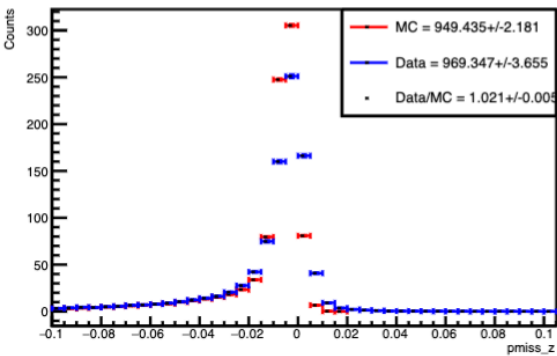
Momentum_x Distribution



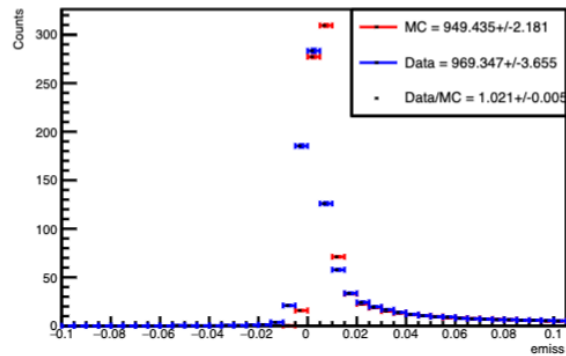
Momentum_y Distribution



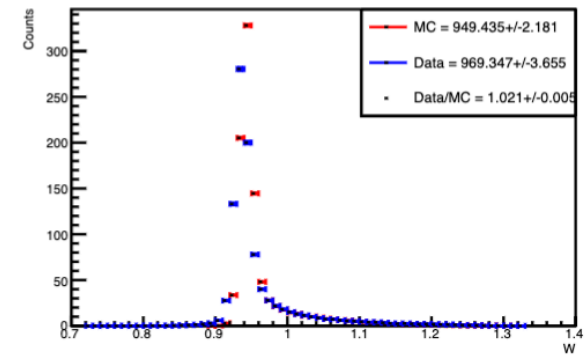
Momentum_z Distribution



Energy Distribution



W Distribution

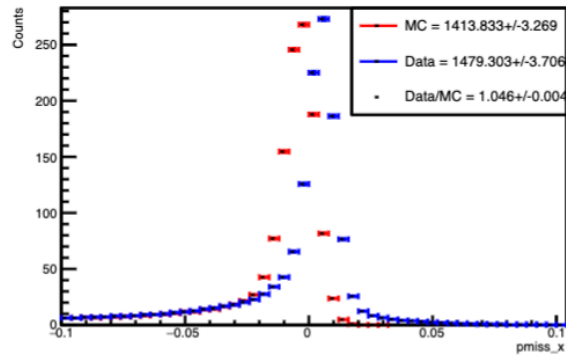


Data vs. MC

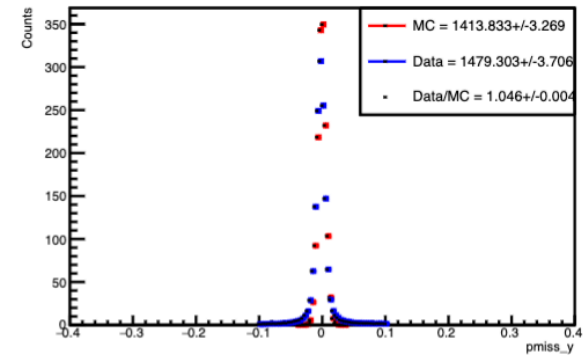
4.9 GeV

HeePCoin Setting
Beam Energy = 4.930
HMS_p = 3.1239999999999997
HMS_theta = 27.15
SHMS_p = 2.583
SHMS_theta = 33.5

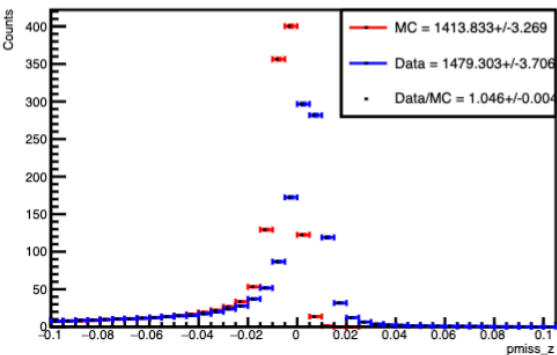
Momentum_x Distribution



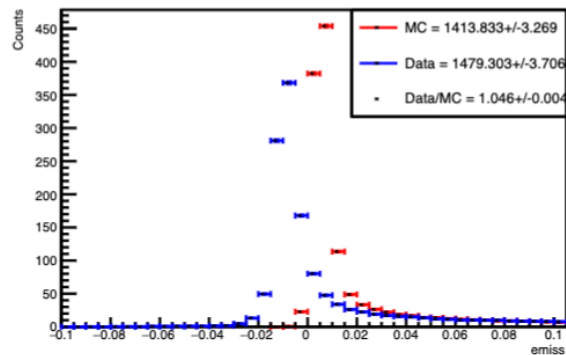
Momentum_y Distribution



Momentum_z Distribution



Energy Distribution



W Distribution

